

AMENDMENTS TO THE CLAIMS

*Please cancel claim 35 without prejudice or disclaimer and amend claims 1, 2, 8-12, 14, 19, 30, 31, and 36 as provided below:*

1. (Currently Amended) An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus comprising: an induction coil surrounding said path; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic; wherein said welding wire is a cored or solid welding wire.

2. (Currently Amended) An apparatus as defined in claim 1An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus comprising: an induction coil surrounding said path; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic, wherein said welding wire is a cored wire with an outer sheath and said physical characteristic is the wall thickness of said sheath.

3. (Original) An apparatus as defined in claim 2 wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil.

4. (Original) An apparatus as defined in claim 3 wherein said reference core is a piece of welding wire having a desired magnitude for said physical characteristic.

5. (Original) An apparatus as defined in claim 4 wherein said reference core is a cored wire with an outer sheath having a desired wall thickness.

6. (Original) An apparatus as defined in claim 3 wherein said reference core is a cored wire with an outer sheath having a desired wall thickness.

7. (Original) An apparatus as defined in claim 1 wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil.

8. (Currently Amended) An apparatus as defined in claim 7 An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus comprising: an induction coil surrounding said path; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic, 1 wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil, and wherein said reference core is a piece of welding wire having a desired magnitude for said physical characteristic.

9. (Currently Amended) An apparatus as defined in ~~claim 7~~claim 8 wherein said reference core is a cored wire with an outer sheath having a desired wall thickness.

10. (Currently Amended) An apparatus as defined in ~~claim 5~~claim 16 wherein said reference core is a ~~cored~~solid metal wire with an outer sheath having a desired diameterwall thickness.

11. (Currently Amended) An apparatus as defined in ~~claim 7~~claim 8 wherein said reference coil is connected in a bridge with said induction coil and driven mutually by said AC current.

12. (Currently Amended) An apparatus as defined in claim 11 An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus

comprising: an induction coil surrounding said path; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic; wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil; wherein said reference coil is connected in a bridge with said induction coil and driven mutually by said AC current; and wherein said reference core is a piece of welding wire having a desired magnitude for said physical characteristic.

13. (Original) An apparatus as defined in claim 12 wherein said reference core is a cored wire with an outer sheath having a desired wall thickness.

14. (Currently Amended) An apparatus as defined in claim 1 An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus comprising: an induction coil surrounding said path; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic; wherein said welding wire is a solid metal wire and said physical characteristic is the diameter of said wire.

15. (Original) An apparatus as defined in claim 14 wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil.

16. (Original) An apparatus as defined in claim 15 wherein said reference core is a piece of welding wire having a desired magnitude for said physical characteristic.

17. (Original) An apparatus as defined in claim 14 wherein said output device has a visual mechanism to display said magnitude of said physical characteristic.

18. (Original) An apparatus as defined in claim 2 wherein said output device has a visual mechanism to display said magnitude of said physical characteristic.

19. (Currently Amended) An apparatus as defined in ~~claim 1~~claim 2 wherein said output device has a visual mechanism to display said magnitude of said physical characteristic.

20. (Original) An apparatus for indicating the wall thickness of a cored welding wire traveling in a given path, said apparatus comprising: a first induction coil surrounding said path; a source of AC current connected across said coil; a second reference coil connected to said AC source; said second reference coil surrounding a fixed section of cored welding wire with a desired wall thickness; and, an output device indicating deviation of the wall thickness of said traveling wire from the wall thickness of said fixed section of wire by detecting the inductive reactance of said first coil compared to said second coil.

21. (Original) An apparatus as defined in claim 20 including an adjustable resistor in series with one of said coils to balance the inductance reactance of said coils.

22. (Original) An apparatus as defined in claim 21 wherein said adjustable resistor is in series with said reference coil.

23. (Original) An apparatus as defined in claim 22 wherein said output device includes a LVDT having a first input driven by said AC current signal, a second input with a signal having a waveform controlled by the magnitude of the difference between said inductive reactance and an output based upon a comparison of said signals at said first and second inputs.

24. (Original) An apparatus as defined in claim 21 wherein said output device includes a LVDT having a first input driven by said AC current signal, a second input with a signal having a waveform controlled by the magnitude of the difference between said inductive reactance and an output based upon a comparison of said signals at said first and second inputs.

25. (Original) An apparatus as defined in claim 20 wherein said output device includes a LVDT having a first input driven by said AC current signal, a second input with a signal having a waveform controlled by the magnitude of the difference between said inductive reactance and an output based upon a comparison of said signals at said first and second inputs.

26. (Original) An apparatus as defined in claim 25 wherein said first and second coils have substantially the same number of turns and the same lengths.

27. (Original) An apparatus as defined in claim 22 wherein said first and second coils have substantially the same number of turns and the same lengths.

28. (Original) An apparatus as defined in claim 21 wherein said first and second coils have substantially the same number of turns and the same lengths.

29. (Original) An apparatus as defined in claim 20 wherein said first and second coils have substantially the same number of turns and the same lengths.

30. (Currently Amended) An apparatus as defined in claim 20 claim 29 herein said length is less than 6 inches.

31. (Currently Amended) A method of measuring deviation of the wall thickness of a cored welding wire moving along a given path from a desired wall thickness, said method comprising:

- (a) placing a coil around said path;
- (b) energizing said coil with an AC current;
- (b1) moving a cored welding wire through said coil along said path;
- (c) measuring the inductive reactance of said coil as said cored welding electrode moves along said path;
- (d) comparing said measured inductive reactance with a reference inductive reactance relating to said desired wall thickness; and,
- (e) providing an output based upon said comparison.

32. (Original) A method as defined in claim 31 wherein said reference inductive reactance is provided by a coil energized by said AC current and having a fixed reference core.

33. (Original) A method as defined in claim 32 wherein said reference core is a length of cored wire having the desired wall thickness.

34. (Original) A method as defined in claim 31 wherein said reference core is a length of cored wire having the desired wall thickness.

35. Cancelled

36. (Currently Amended) An apparatus as defined in claim 35 An apparatus for indicating a physical characteristic along the length of a welding wire traveling in a given path, said apparatus comprising: an induction coil surrounding said path with a length of less than 6 inches; a source of AC current connected across said coil, a first circuit to measure the inductive reactance of said coil; a second circuit to compare said measured inductive reactance with a reference inductive reactance; and, an output device responsive to a difference between said measured inductive reactance and said reference inductive reactance to indicate the magnitude of said physical characteristic, wherein said welding wire is a cored wire with an outer sheath and said physical characteristic is the wall thickness of said sheath.

37. (Original) An apparatus as defined in claim 36 wherein said reference inductive reactance is the inductive reactance across a reference coil with a selected reference core fixed in said reference coil.

38. (Original) An apparatus as defined in claim 37 wherein said reference coil has the same general length as said induction coil.

39. (Original) An apparatus as defined in claim 37 wherein said reference core is a piece of welding wire having a desired magnitude for said physical characteristic.

40. (Original) An apparatus as defined in claim 39 wherein said reference core is a cored wire with an outer sheath having a desired wall thickness.